center frequency and relative frequency spacing of said simultaneous plurality of signals, wherein

said center frequency is selectively adjusted to cover at least a portion of the selected frequency band;

a modulator connected to said multi-signal generator for selectively and simultaneously modulating said plurality of signals; and

a control unit for selectively controlling at least one of said multi-signal generator center frequency and relative frequency spacing.

In claim 13, line 3, after "of", please insert --carrier--.

Remarks

Claims 1-22 are pending in the present application. Claims 1 and 13 are amended to more clearly claim the present invention and to expedite prosecution of the present Application.

Claims 1-5 are rejected under 35 USC 102(b) as being anticipated by Maxwell '921 wherein the Examiner asserts that Maxwell discloses a transmitter, comprising a multi-signal generator for providing a plurality of signals within a selected frequency band and having a center frequency and a relative frequency spacing, said center frequency being selectively adjusted to cover at least a portion of the selected frequency, and having preselected various radio frequencies and bands.

Applicant argues that the apparatus taught and/or suggested by

Maxwell provides only a single signal *stepped* or otherwise varied *through* the receiver bands, or alternately provides a signal which is difficult to receive in the bands transmitted, or in the further alternative provides a signal if received will be audibly distorted an ineffective in providing the structure and function taught in his patent.

Firstly, Maxwell thoroughly admits throughout his patent that he uses Time Division Multiplexing (TDM) of the frequency transmitted, e.g. col 7, lines 8-18. Thus the transmitter carrier can only be on one frequency at a time.

Secondly, many receivers (and virtually all receivers that employ digital station selection and readout) employ Phase-Locked Loops in their tuning and/or demodulation circuitry, which require a minimal time of stable signal reception on which to lock. The apparatus and method of Maxwell can only provide a maximum of 1/N (where N is the number of channels to be covered by his apparatus) on which the receiver PLLs will fail to acquire signal lock or lose lock in the intervening period (1-1/N) if acquisition and lock is achieved. Since most receivers squelch the received audio until well after PLL lock, the resulting demodulated audio, if achieved, will never be heard by the listener.

Thirdly and alternately, if not squelched, on any one of the N channels, would receive only 1/N of the audio amplitude, the remainder being either the interchannel noise or the local station. Furthermore, the combination of Maxwell's "TDM" carrier, message modulation and local station carrier and modulation is highly

likely to be unintelligible or at best, highly distorted so as to be unintelligible. Thus Applicant argues that Maxwell does not transmit true simultaneous carriers but only useless simulations thereof, such that if any simultaneous signal were generated, such would only occur from distortions caused by the limitations of the circuitry hardware.

By contrast, the present invention according to claim 1, as amended, includes:

> "a multi-signal generator for simultaneously providing a plurality of signals within a selected frequency band and having a center frequency and relative frequency spacing of said simultaneous plurality of signals,...

not found in the cited art of record. As argued above, Maxwell does not *simultaneously* provide the claimed multi-frequency generator providing a plurality of signals within a selected frequency band. Applicant further argues that his structure is inoperative or inoperative according to the specification of the patent. Moreover, his method and structure is entirely different from the claimed invention, and Maxwell explicitly argues against transmitting multiple frequencies simultaneously, col. 2, line 10. Therefore the rejection of claim 1 under 102(b) is without support from Maxwell and should be withdrawn. Furthermore, Maxwell cannot provide the claimed invention except by undue experimentation and according to the present application.

Dependent claims 2-5 provide additional inventive features to further patentably distinguish the present invention from the cited art of record. Applicant therefore believes that the rejection of claims 1-5 under 35 USC 102(b) as being anticipated by Maxwell '921

is overcome.

Claims 6-11 were rejected under 35 USC 103(a) as being unpatentable over Maxwell in view of Argo et al., '978. Claims 6-11, ultimately dependent claim 1 distinguished above, provide additional inventive features to further patentably distinguish the present invention from the cited art of record. Applicant therefore believes that the rejection of claims 6-11 under 35 USC 103(a) as being unpatentable over Maxwell in view of Argo et al., '978 is overcome.

Claims 12-16 were rejected under 35 USC 103(a) as being unpatentable over Maxwell in view of Wilson, '868. Regarding independent claim 13, the Examiner asserts that Maxwell shows the first signal and the second signal generators having DDS outputs for FM band spaced-frequencies, the AM band spaced frequencies, the control means, the mixer and the power amplifier.

Applicant notes that, as argued above, Maxwell's DDS merely steps through a range of frequencies, e.g. col 8, lines 42-45.

By contrast the present invention according to claim 13, as amended, includes:

> "a first signal generator for simultaneously providing a plurality of carrier signals within a frequency band and having a relative frequency spacing, and including an amplitude modulator of said plurality of said plurality of signals according to a modulation signal;

not found in the cited art of record. Maxwell does not nor cannot simultaneously provide a plurality of carrier signals within a frequency band as claimed. Since Maxwell argues against simultaneous transmissions (col 2, line 10) it is clear that not

generation of simultaneous carrier signal, his intention is to *not* provide such signals, and not provide apparatus that can do so or be modified without undue experimentation to do so. Wilson adds nothing relevant to the claimed invention, nor suggests any combination with Maxwell to result in the present invention. Therefore, the apparatus of claim 13, as amended, is not provided by Maxwell or Wilson, alone or in combination.

The claims 12, dependent on claim 1 patentably distinguished above, and claims 14-16 which provide additional inventive features, further patentably distinguish the present invention over the cited art of record. Applicant therefore believes that the rejection of claims 12-16 were rejected under 35 USC 103(a) as being unpatentable over Maxwell in view of Wilson, '868, are overcome.

Claims 17-20 were rejected under 35 USC 103(a) as being unpatentable over Maxwell in view of Morris '763 (or Hunsinger et al., '396). With regard to claim 17, the Examiner argues that Morris (believed to mean Hunsinger '396) provides a corresponding sum of sine wave signals each corresponding to one of the set of carrier frequency, dividing the sum...calculating a variance... changing the phase...repeating...transmitting...sum of said sine wave signals, and thus that it would have been obvious to one of ordinary skill in the art at the time of invention to modify and add Morris's (or Hunsinger's) amplitude balancing by adjusting the relative phase to Maxwell, such that the modulated signal could control and balance the amplitude of the summed signal.

Applicant notes that Morris teaches and discloses a SSB modulator, providing no carrier signal generation teaching. Similarly, Applicant notes that Hunsinger utilizes a single carrier which is both AM and FM modulated; no set of carriers are provided. In either reference, a single band channel output is provided.

By contrast, the inventive method according to claim 17, comprises the steps of:

> "selecting a set of carrier frequencies;
> providing a corresponding sum of sine wave signals each corresponding to one of the set of carrier frequencies;
> dividing the sum into a number of segments in the time domain;
> calculating a variance of the magnitudes of each said segment;
> changing the phase relationship of said sine wave signals to minimize the variance;
> repeating the steps of calculating and changing until the minimization of the variance from said changes is less than a desired threshold significance value; and
> transmitting a signal corresponding to said sum of said sine wave signals

not found in the cited art of record. The Examiner's argument apparently acknowledges and concedes that Hunsinger [Morris] does not select a set of carrier frequencies as claimed, but stating that the sine wave signals in the cited art "...each corresponding to *one* of the set of carrier frequency..." (emphasis added) but do not comprise a set of carrier frequencies as claimed. Furthermore the cited art does not divide the sum into a number of segments in the time domain as claimed, nor calculates a variance of the magnitudes of each said segment as claimed, nor change the phase relationship of said sine wave signals to minimize the variance as claimed, and certainly does not repeat the steps of calculating and changing until the minimization of the variance from said changes

is less than a desired threshold significance value, as claimed in claim 17. The cited art merely teaches simple FM and AM modulation (e.g. multiplication) and signal addition, providing no teaching, disclosure or suggestion of the claimed steps as argued, above. Furthermore, the cited art cannot be modified except by undue experimentation or according to the present Application to provide the method according to claim 17. Furthermore, the claims dependent on claim 17 provide additional inventive features to further patentably distinguish the present invention over the cited art of record. Therefore, Applicant believes that the rejection of claims 17-20 under 35 USC 103(a) as being unpatentable over Maxwell in view of Morris '763 (or Hunsinger et al., '396) is improper and without support and should be withdrawn, or in the alternative, is overcome.

Claims 21-22 were rejected under 35 USC 103(a) as being unpatentable over Maxwell in view of Argo et al., and further in view of Hunsinger et al., '396. Applicant argues that the additionally claimed inventive steps or their equivalent are clearly not present in the cited art of record. The Examiner's reference to mere AM or FM modulation of single FM and AM carrier signals cannot be said to be the claimed operation on the set of carrier frequencies as claimed. Therefore Applicant believes that the rejection of claims 21-22 under 35 USC 103(a) as being unpatentable over Maxwell in view of Argo et al., and further in view of Hunsinger et al., '396 is overcome.

Applicant, having amended the claims and having overcome the rejections to the present patent Application, believes that the present application is in condition for allowance. Applicant respectfully requests reconsideration and allowance of the present application. The Examiner is invited to call the Applicant's undersigned attorney should he feel that such a call would further the prosecution of the present application.

Respectfully submitted,
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Amended Claim 1

1. (amended) A transmitter, comprising:

a multi-signal generator for simultaneously providing a plurality of signals within a selected frequency band and having a center frequency and relative frequency spacing of said simultaneous plurality of signals, wherein

said center frequency is selectively adjusted to cover at least a portion of the selected frequency band;

a modulator connected to said multi-signal generator for selectively and simultaneously modulating said plurality of signals; and

a control unit for selectively controlling at least one of said multi-signal generator center frequency and relative frequency spacing.

Amended Claim 13

13. A dual-mode transmitter, comprising:

a first signal generator for simultaneously providing a plurality of carrier signals within a frequency band and having a relative frequency spacing, and including an amplitude modulator of said plurality of said plurality of signals according to a modulation signal;

a second signal generator for selectively providing a selectable frequency signal, and including a frequency modulator of said selectable frequency according to a modulation signal;

a mixer receiving the output signals of said first and second signal generators, and providing an output signal;

a power amplifier for selectively receiving said signals corresponding to said plurality of signals from said first signal generator and said mixer output signal, providing a signal to an antenna according to said selectively received signal; and

a control means for selectably enabling said first signal amplitude modulator in a first mode, and said second signal generator frequency modulator in a second mode.